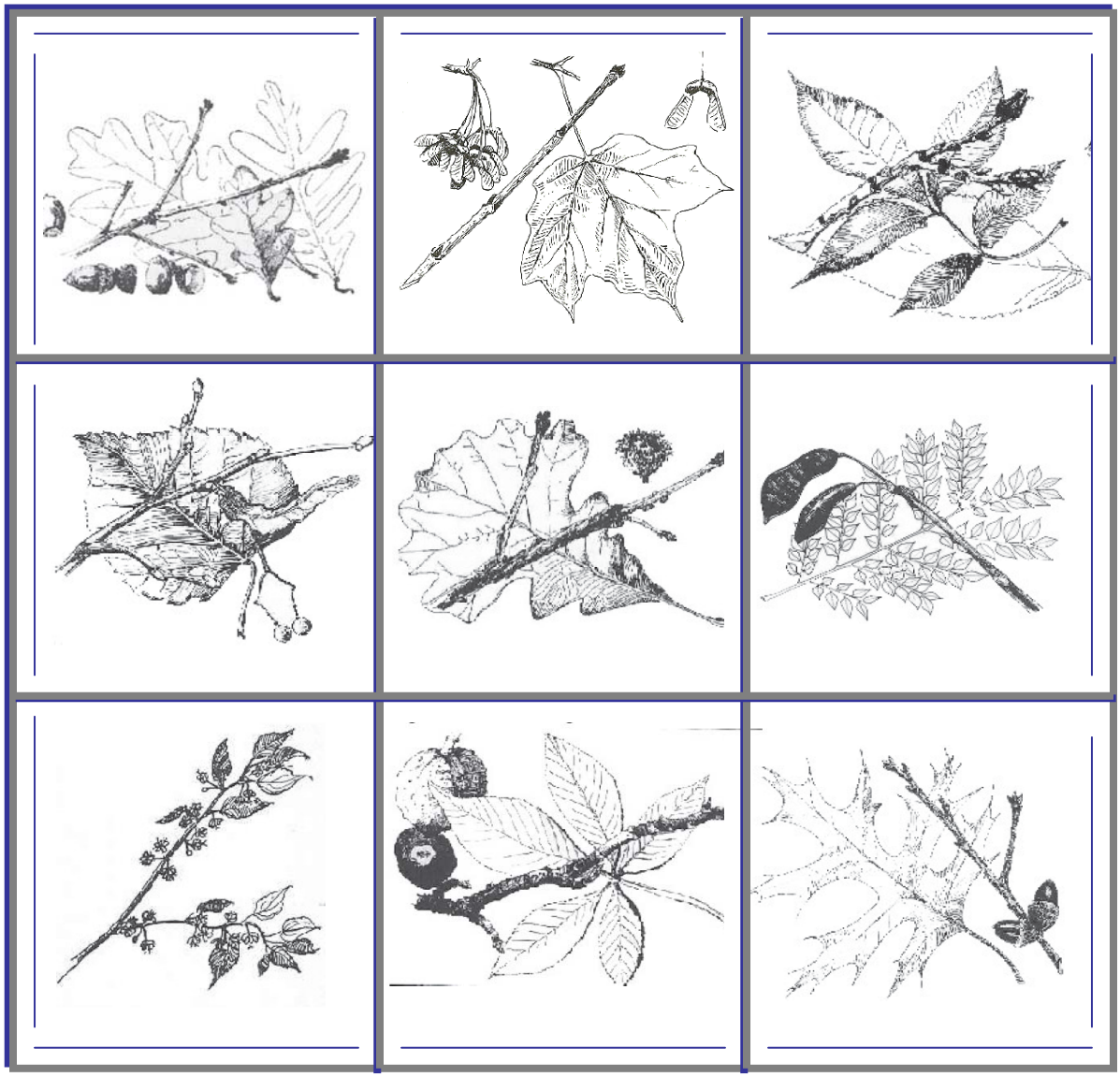
Trees for Kids

Ecological Diversity



2009-2010 School Year

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A special thank you to all the Trees for Kids / Teens Partners for 2009!

Trees for Kids 2009 -2010

The Program

Trees For Kids / Teens is an educational program that involves learning about and planting trees, with a focus on Iowa's elementary and secondary school students. Its goals are to educate students about the values of trees and to encourage tree planting projects at schools or other public areas around the state of Iowa.

This unique program is sponsored by the Iowa Department of Natural Resources – Bureau of Forestry, MidAmerican Energy, Black Hills Energy, Alliant Energy, Trees Forever, Iowa Tree Farm Committee, Iowa Woodland Owners Association, Iowa Bankers Association, and Iowa Landscape and Nursery Association.

The educational materials include tree/forestry lesson plans and classroom activities which are designed to meet the educational standards and benchmarks for Iowa and at the national level. These lessons compliment science, reading, math, geography, computer skills, history, and other subjects. Feel free to utilize any or all of the materials and to print/photocopy specific activities. If you would like a hard copy, please contact the Iowa DNR Trees for Kids Coordinator at 515/ 281-6749 or visit the TFK / TFT webpage at: www.iowadnr.gov/forestry/treesforkids.

The Trees

Trees for Kids / Teens offers opportunities to have demonstration tree plantings at your school every spring and fall though a grant process. Schools are selected based on their grant application, with over 16 projects funded a year. Please visit the Tree for Kids website www.iowadnr.gov/forestry/treesforkids for an application. If you have questions about the application process or the program contact your local District Forester or the Trees for Kids Coordinator at (515)281-6749.

Materials, Layout and Design
Emma Bruemmer, Iowa DNR
TFK / TFT Coordinator
502 E. 9th
Des Moines, IA 50319
515 / 281-6749

Bureau of Forestry

Lesson 1: Are We Different or Similar?

A Lesson on Diversity

Goal: Students will

1) Learn and explain the concept of a Venn diagram
2) Relate information from an interview and apply it to a Venn diagram
3) Identify similarities and differences
4) Become familiar with the word diversity

Objective:

Practice making and using Venn diagrams
Practice working in groups and interviewing

Benchmarks:

Iowa Benchmarks Literacy 3- 5: Students can draw conclusions, make inferences, and deduce meaning

National History and Social Science K-3: Recognize the ways in which they are all part of the same community, sharing principles, goals, and traditions despite their varied ancestry; the forms of diversity in their school and community; and the benefits and challenges of a diverse population. All students will conduct investigations by formulating a clear statement of a question, gathering and organizing information from a variety of sources, analyzing and interpreting information.

Materials:

- 20 White pieces of paper
- 10 small paper plates for younger ages
- Diversity interview questions
- Computer - optional

Lesson:

Ask: How people are different from one another? Do you think people have more similarities or differences?

Do:

1) Ask the students if they have heard of or made a Venn diagram. Tell the students that a Venn diagram consists of circles that overlap each other. Show students how to draw them, noticing how large they are and how they overlap making space in the middle. Tell them they will be making their own Venn diagram.

2) Pair students and pass out pieces of paper to each pair of students. Have them work together to draw the Venn diagram. For younger students small paper

plates can be used to help make the circles. Show the students how to label the diagram with their name and their partners name on the top of each of the outside circles. Have the students put the word same or similarities on the top of the middle overlapping part.
3) Have students interview each other, putting answers in the Venn diagrams. Explain how the answers that are the same go in the middle and the answers that are different go in their own labeled circle. To keep on track, make a list of questions for them to ask each other such as favorite foods, type of pets, number of family members, or favorite color.

Reflect:

Briefly go over the results of the diagrams with the students. Ask if there were any students who found their entire interview questions landed in the similarities or differences circles. Did most people have some things in common and some differences?

Apply:

Ask the students if they know any words that describe the differences and similarities of people. After brainstorming words ask students if they have heard of the word diversity. Explain that the word diversity means understanding that each individual is unique and different and differences should be embraced and celebrated.

Additional Project:

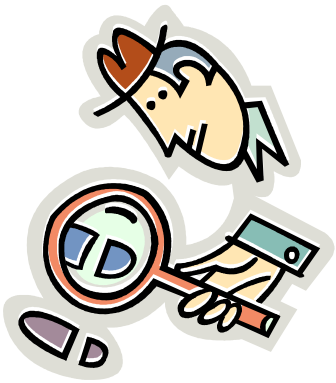
Take student to the computer lab to make a copy of their Venn diagram. Teach student to change page setup to landscape. Use the drawing tools to make circles and use the undo tool if their circles are not overlapping correctly. Insert text boxes to write within the circles. When they finish, students can type a journal entry about what diversity means to them.

Other Lessons on Diversity can be found on the Diversity Council website at http://www.diversitycouncil.org/activities.shtml

Extra Activity:

Math Decoder

Solve the problems and fill in the blanks using the decoder key to find the secret message.



10 ÷ 2	3 x 8	1 x 5	5 _ 4 5 5	2 _ 1 3 3

8 ÷ 2	5 ÷ 1	1 0 + 5 5	7 ÷ 7	3 _ 1 3 3	8 ÷ 1

7 x 1	1 ÷ 1

7 x 0	3 x 6	7 ÷ 1	10 x 3	3 ÷ 0	1 x 5

Decoder Key

A	B	C	D	E	F	G	H	I	J	K	L	M
1/2	12	25	11	5	3	2	1/4	7	27	16	5/8	5/9

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
18	2/3	4	30	1/5	1	33	0	24	36	8	1/3	21

Lesson 2: **Nature Walk:** Every Tree is Different

Goal: Students will

1) Learn different parts of the tree
2) Learn that trees make their own food through photosynthesis
3) Know how to press leaves
4) Be able to identify and categorize leaves

Objective:

Practice reflecting in journal writing
Practice organizing and categorizing different trees species
Practice using the internet to answer unknowns

Benchmarks:

Iowa Benchmarks Literacy, 3 – 5: Students can draw conclusions, make inferences, and deduce meaning.
Iowa Benchmarks Science, 3 – 5: Students can understand and apply the processes and skills of scientific inquiry. Students can understand concepts and relationships in life science. Students can understand structures of living things. Students can understand environmental interaction and adaptation.
National Science Standards, Elementary: Interrelationships of form, function, and behaviors in living and nonliving systems. Distinguishing characteristics plants, animals, and other living things. Order and classify in multiple ways living things and ways organisms function and depend on their environments.

Materials:

- Leaves collected on field trip 5 per student
- Journal and pencil
- Leaf press or old phone books
- Heavy books
- Construction paper
- White glue
- Computer lab -optional

Lesson:

Ask: How do you know a tree's name? What trees are around the school?

Do:

1) Students will go on a nature hike around the school to look at different trees bringing along their journals to record their thoughts. Along the way stop and ask questions for the student to record in their nature journal. Some questions to ask are: How do you know this is a tree? What are the parts that make it a tree? What part of the tree can you see? What parts of the tree can you not

see? What does the tree need to survive? What do trees eat? What do leaves do? What is Photosynthesis?
2) As you stop to look at some trees, collect five different leaves for every student. For larger classes leaves can be collected ahead of time and left in the classroom for pressing later.
3) When back in the classroom start the leaf-pressing activity. The best way to press leaves is with a leaf press, but pressing can be done on a large scale and low cost using phone books and other books as weights. Take leaves and put them inside the phone book with at least 10 pages between each leaf. To reduce confusion students can write their name on the pages of their leaves. Only use discarded books because the oils can stain the pages. Use other heavy books to put weight on top of the phone books. Wait one week for leaves to dry.
4) When leaves are dry, students can glue leaves to construction paper. They can make a book of leaves by punching holes in the paper and stringing yarn through the holes or use the pressings later for leaf rubbings.

Reflect:

Ask the students if all of the leaves are the same? How are they different? How could they find out the names of the trees from the collected leaves?

Apply:

Using the *20 Native Trees of Iowa* found at http://www.iowadnr.gov/forestry/treesforkids.html to help students Identify their leaves. Have students label their leaves. Explain to them this process of identifying leaves is called dendrology. If leaves are not found in the 20 native leaves booklet, students can identify them at the computer lab by using a key. Some recommended websites for identification are:
http://www.cnr.vt.edu/dendro/forsite/key/intro.htm or
http://www.oplin.lib.oh.us/tree/

Extra Activity:

20 Native Trees of Iowa

h c u r h c m r k h h o n c y a i h y
r r f c o c k s p u r h a w t h o r n
l r i a b r k h k y i y m g i i r i e
n i r i r c n a n w p o e h u e k n k
m o n a y r o k c i h k r a b g a h s
a d r d k d c m o i e b i e i m o k h
e e r t e e f f o c y k c u t n e k i
b w d r h n h b c r o i a e t a t a n
n a o a b e u n r h v a n b o h i o g
r l b n y c r e a r r s h a c r h n l
o e o l k g b n e n k n o g r a w i e
h o a e a k p s p v n a r h n k p p o
p o y o c c y h o i a y n r o k m a a
o e w a e n k e g e n r b u r o a k k
h e h r w k o m b i a o e e g a w n u
s d o o w g o d a d o g a p r c s i e
i r d o p z a i m p n n m k p r v h i
y w i t c h h a z e l c f w y n y c f
w o e n g a e w h i t e o a k i r m b

American Hornbeam	Black Maple	Bur Oak
Chinkapin Oak	Cockspur Hawthorn	Downy Serviceberry
Hackberry	Hophornbeam	Kentucky Coffeetree
Linden	Nannyberry	Northern Pin Oak
Ohio Buckeye	Pagoda Dogwood	Red Oak
Shagbark Hickory	Shingle Oak	Swamp White Oak
White Oak	Witchhazel	

make your own wordsearch at http://www.armoredpenguin.com/wordsearch/

Lesson 3: Wildlife Habitat

Goals: Students will

1) Understand what people and wildlife need to live
2) Be able to match information using descriptive clues
3) Learn the word "habitat"
4) Know the importance forest diversity

Objectives:

Practice matching with descriptive clues
Practice using the internet to answer unknowns

Benchmarks:

Iowa Benchmarks Literacy, 3 – 5: Students can draw conclusions, make inferences, and deduce meaning. Students can comprehend what they read in a variety of literary and informational texts.
Iowa Benchmarks Science, 3 – 5: Students can understand and apply the processes and skills of scientific inquiry. Students can understand concepts and relationships in life science. Students can understand structures of living things. Students can understand environmental interaction and adaptation.
National Science Standards, Elementary- Knowledge of the kinds of relationships that exist among organisms, the *kinds* of physical conditions that organisms must cope with, the *kinds* of environments created by the interaction of organisms with one another and their physical surroundings, and the complexity of such systems. Interrelationships of form, function, and behaviors in living and nonliving systems. Characteristics distinguishing plants, animals, and other living things. Multiple ways to order and classify living things. Ways organisms function and depend on their environments.

Materials:

- Pencil and paper
- Matching habitat worksheet
- Computer lab or library

Lesson:

Ask: What do humans need to live? Do animals need these similar things?

Do:

1) Have students brainstorm about what they need to live. Share answers making sure that they list the essentials: food, water, shelter, and space.
2) Ask what wildlife animals need to live. Ask how trees can provide those needs. Tell them how wildlife can get food from trees (nuts, berries, leaves, other animals that live in the tree) and shelter (cover and nesting areas for their

young). Introduce the word habitat which means: the area or environment where a plant or animal lives.
3) Have students fill out the habitat matching worksheet, matching the description of the animal's needs and habitat to the picture.

Reflect:

Ask: Did all of the animals live in the same places? Is it important to have different types of forest for these animals to live, eat, and nest? What would happen if we did not have a diverse mix of trees?

Apply:

Have students research an animal of their own and write down information on habitat, food, nests, young, and a fun fact. Below is a list of threatened or endangered woodland animals in Iowa, excluding the Indiana Bat, Red-shouldered Hawk and Southern Flying Squirrel.

Bald Eagle
Common Barn Owl
Blue-spotted Salamander
Central Newt
Copperbelly Water Snake
Copperhead
Long-eared Owl
Orangethroat Darter
Peregrine Falcon
Red-backed Vole

Matching Wildlife Worksheet:

Match the picture of the woodland animal to their description

Indiana Bat

Habitat: Oak Hickory Forests
Food: acorns, hickory nuts and walnuts
Nesting: In large mature trees
Young: 3 or 4 twice a year
Size: 2 inches tall and ¼ an ounce
Fun Fact: they steer with their tails as they fly

Pileated Woodpecker

Habitat: Large trees with loose bark, slow moving rivers, and caves
Food: night flying insects
Nesting: loose bark of trees, caves in winter
Young: 1
Size: 10 inches long and 3 ounces
Fun Fact: 30,000 insects eaten per feeding

Iowa Pleistocene Snail

Habitat: Cold air slopes with leaf litter and rocks
Food: fallen leaves of birch, maple and dogwood
Nesting: fallen leaves
Young: 2 to 6
Size: ¼ of an inch
Fun Fact: Known from fossil records to have existed 400,000 years ago. Once thought to be extinct but was discovered again in 1955.

Southern Flying Squirrel

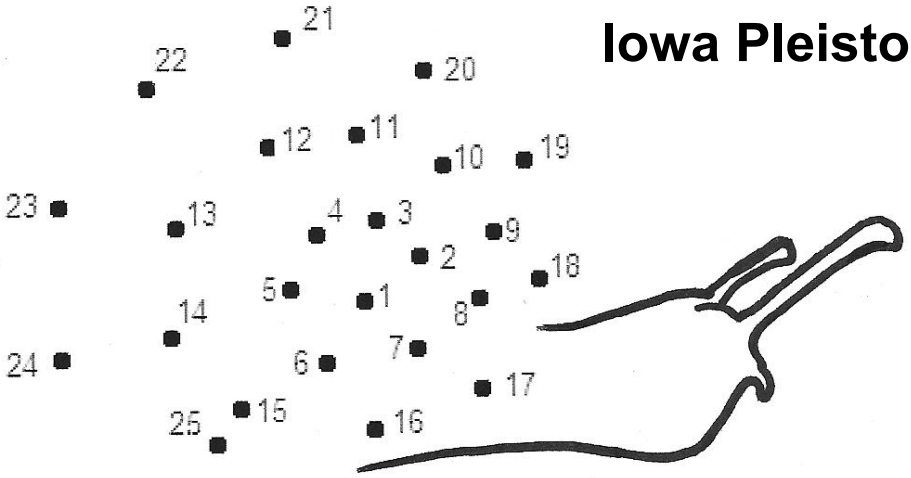
Habitat: At least 250 acres of medium to mature even aged forests dominated by maple and cottonwood trees
Food: Small mammals, birds, reptiles, amphibians, and crayfish
Nesting: large mature trees
Young: 2 to 5
Size: 17 inches tall and 1 ½ pounds
Fun Fact: Nests in the same spot year after year

Red Shouldered Hawk

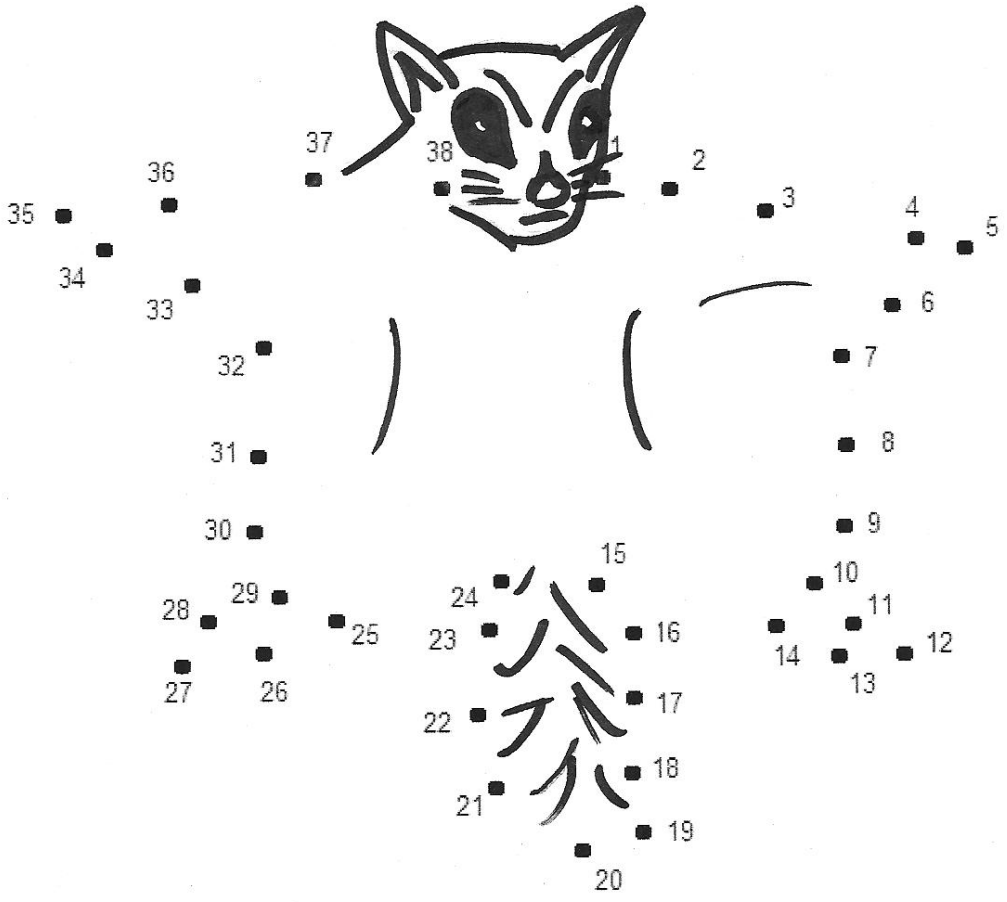
Habitat: Mature Forests
Food: Insects, primarily carpenter ants and wood-boring beetle larvae, fruits, and nuts
Nesting: in tree unlined except for wood chips
Young: 1 to 6
Size: 17 inches tall and 10 ounces
Fun Fact: Can make their cavity so deep for nesting that trees can split in half

Extra Activity: Dot to Dot coloring

Iowa Pleistocene Snail



Southern Flying Squirrel



Lesson 4: **Emerald Ash Borer:** An Invasive Species

Goals: Students will

1) Learn the phrase "exotic and invasive species"
2) Understand how invasive species move and spread
3) Know the lifecycle of the emerald ash borer
4) Know how invasive species can be slowed or prevented

Objectives:

Practice acting and simulating what they have learned
Practice using the internet to answer unknowns

Benchmarks:

Iowa Benchmarks Literacy, 3 – 5: Students can draw conclusions, make inferences, and deduce meaning.
Iowa Benchmarks Science, 3 – 5: Students can understand and apply the processes and skills of scientific inquiry. Students can understand concepts and relationships in life science. Students can understand structures of living things. Students can understand environmental interaction and adaptation.
National Science Standards, Elementary- knowledge of the kinds of relationships that exist among organisms, the *kinds* of physical conditions that organisms must cope with, the kinds of environments created by the interaction of organisms with one another and their physical surroundings, and the complexity of such systems. Interrelationships of form, function, and behaviors in living and nonliving systems. Distinguishing characteristics of plants, animals, and other living things. Order and classify in multiple ways to living things. Ways organisms function and depend on their environments.

Materials:

- Crayon, maker, or colored pencil
- Map worksheet
- Computer lab

Lesson:

Ask: Have you ever heard of emerald ash borer? What is an exotic or invasive species?

Do:

1) Explain to students what are exotic and invasive plants and animals. Exotic species are plants or animals that were brought from other countries on purpose or accident. Due to this movement species are away form their original habitat. Some people call exotic species introduced or non-native species. These exotic animals can be good or possibly harmful to the new habitat or ecosystem. Some

examples of exotic animals that are beneficial to us are horses and honey bees. Other exotic plants or animals that are harmful are called invasive species. Many invasive species take over habitats of our native plants and animals. An example of an invasive species that is harming trees is emerald ash borer.

2) Explain what emerald ash borer is: emerald ash borer, also know by its initials EAB is a small beetle that is smaller than the size of a penny. Its original habitat and ecosystem is in China and other parts of eastern Asia. EAB accidentally came to the USA attached to other materials being shipped to the Michigan area. During the summer EAB lays eggs in the little cracks in the bark of ash trees. She can lay up to 80 eggs! The eggs hatch within one to two weeks. The baby EABs are called larvae, which look like small white flat worms. The larvae are less than an inch long, but have a large appetite. They eat into the tree in an S shaped pattern, where the water and nutrients move up and down the tree like a straw called the sapwood. This eating slowly kills the tree by cutting off water to the tree. The larvae stay in the bark over the winter, were it undergoes metamorphosis, much like a butterfly. The larvae become full grown emerald green beetles. The beetle exits the bark, making a D shaped hole. Those beetles then fly to other ash trees, where the process begins all over again. EAB moves in firewood as well.

3) Show them picture of Emerald ash borer and its lifecycle at http://www.emeraldashborer.info/lifecycle.cfm. Additionally, you can show the students a video called *Introducing Emerald Ash Borer* or other EAB videos at http://www.dontmovefirewood.org/videos/list/9rTOkCXHs6o . The video stresses not moving firewood, with a man dressed in a large EAB custom.

4) With a demonstration activity students can learn how some invasive species, such as EAB spread. Have students stand about an arms length from each other. Explain that they are all ash trees and a camper brought firewood with Emerald Ash Borer to one of your student's sites. Pick the student, telling them the EAB has flown to them, laying eggs in the bark. The eggs become larvae and slowly cut off water, the students can act this part out. Then winter comes and goes and the larvae become beetles, and fly to the surrounding trees. Have the student tag the students within arms reach, showing where EAB has flown. Also, now that the original tree has died it becomes firewood and was moved to the other side of the classroom by campers. Have the trees with EAB including the firewood do the same as the first tree, eggs are laid, larvae hatch and cut off water, and EAB beetles fly to surrounding tree (tagging other students in arms reach). Keep this process going until all student trees have EAB.

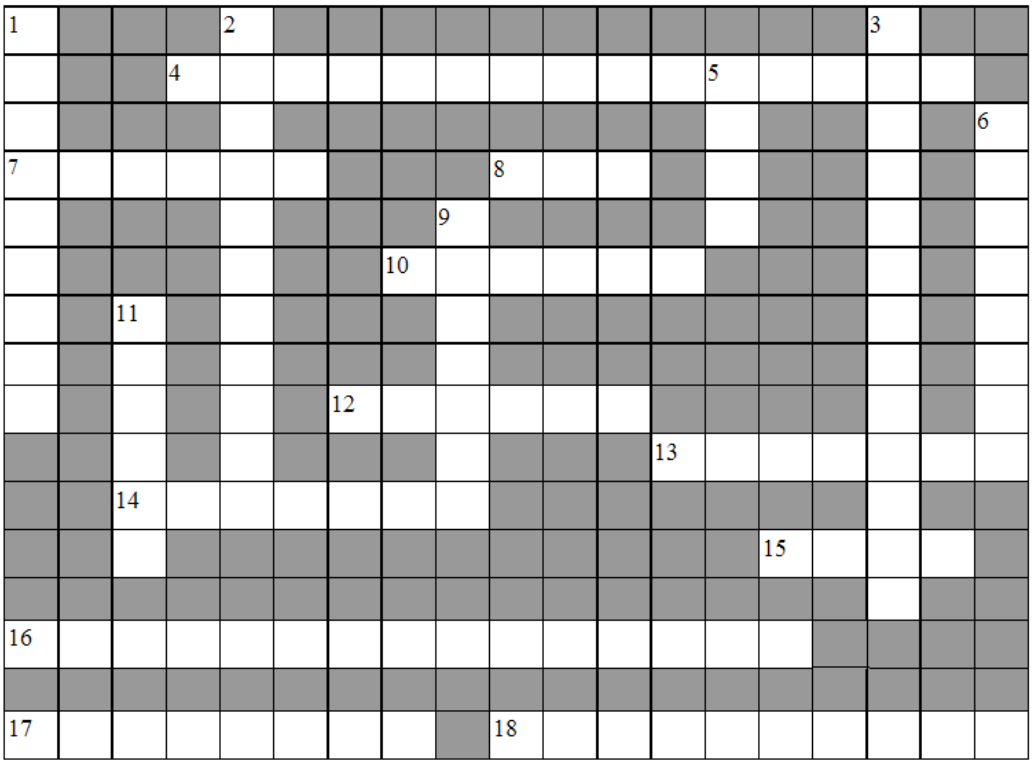
Reflect:

Ask Students: What are some ways that EAB spreads? What are some ways that we can stop EAB from moving? What are some ways that we can prevent losing trees to invasive species like EAB? How far do you think EAB has spread?

Apply:

Have students look up where emerald ash borer is at http://www.emeraldashborer.info/surveyinfo.cfm and color is spread on the below map.

Extra Activity: Emerald Ash Borer Crossword Puzzle



ACROSS

4. an exotic species whose introduction is harmful
7. species that is from another country
8. how EAB travels short distances
10. young that look different for adults prior to metamorphosis
12. occurs naturally in an area
13. the part of a tree where water and nutrients move up and down
14. a species no longer found on earth
15. EAB's native habitat
16. an exotic beetle that feeds on the inner bark of ash trees
17. Where EAB was shipped to from Asia
18. another name for exotic species

DOWN

1. a combination of different species that make up a healthy environment
2. all the living and nonliving things that surround and affect a living thing
3. A change in the form of an animal during normal development
5. EAB can lay almost 80 of these in that bark of a tree
6. how EAB travels long distances
9. a place that provides food, water, shelter and other needs for an organism
11. when EAB lays its eggs

make your own puzzle at http://www.crosswordpuzzlegames.com

Reading Rangers

The Reading Rangers program offers trees to be planted by DNR foresters in the state forests in exchange for students reading nature-related books and publications. For every 20 pages of a nature related publication that is read during Earth Week (April 19 - 23, 2010), the Forestry Bureau will plant a tree in a state forest. Please fill out the form provided and we will plant the trees and send the class a Reading Rangers certificate of appreciation. Please have all forms sent in by May 21, 2010. Please mail your completed sheets to:

Become a Reading Ranger!
Help Iowa's Environment!

School Name & Address: _____

Teacher's Name & Grade Level: _____

Student	Title of Publication	# of Pages Read

Attach Additional Pages if Necessary

Trees for Kids/ Teens
Iowa DNR - Bureau of Forestry
502 E. 9th
Des Moines, IA 50319

Resources

Iowa Department of Natural Resources - Bureau of Forestry
502 E. 9th; Des Moines, IA 50319-0034
515 / 281-5918
http://www.iowadnr.gov/forestry/index.html

MidAmerican Energy
www.midamericanenergy.com

Iowa State University - Forestry Extension
Department of Natural Resource Ecology and Management
339 Science II, Iowa State University;
Ames, Iowa 50011-3221
515 / 294-1168
www.forestry.iastate.edu

Project Learning Tree
Barbara Gigar, Local PLT Coordinator
2473 160th Rd; Guthrie Center, IA 50115
641 / 747-2200
www.plt.org
http://www.iowadnr.com/education/

Natural Resources Conservation Service
Find your local offi ce by visiting:
www.ia.nrcs.usda.gov

Black Hills Energy
www.blackhillscorp.com/

Alliant Energy
www.alliantenergy.com

Trees Forever
770 7th Avenue; Marion, IA 52302
319 / 373-0650
www.treesforever.org

Iowa Woodland Owners Association
Carol Fullenkamp
319 / 837-6178
www.iowawoodlandowners.org

Iowa Tree Farm Committee
www.treefarmsystem.org
Trees For Kids 08 - Iowa DNR

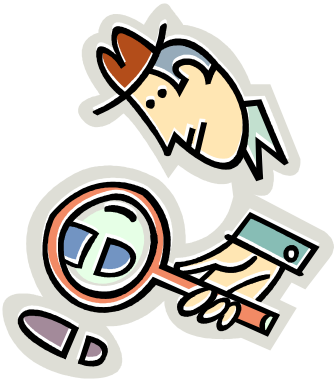
Iowa Nursery and Landscape Association
PO Box 1647; Waterloo, IA 50704
319 / 215-6855
www.iowanla.org

Iowa Bankers Association
8800 NW 62nd Ave; Johnston, IA 50131
515 / 286-4300
www.iowabankers.com

Iowa One Call
www.iowaonecall.com
1-800-292-8989

Math Decoder ANSWERS

Solve the problems and fill in the blanks using the decoder key to find the secret message.



E	V	E	R	Y
10 ÷ 2	3 x 8	1 x 5	5 _ 4 5 5	2 _ 1 3 3

P	E	R	S	O	N
8 ÷ 2	5 ÷ 1	1 0 + 5 5	7 ÷ 7	3 _ 1 3 3	8 ÷ 1

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7 x 1	1 ÷ 1

U	N	I	Q	U	E
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Decoder Key

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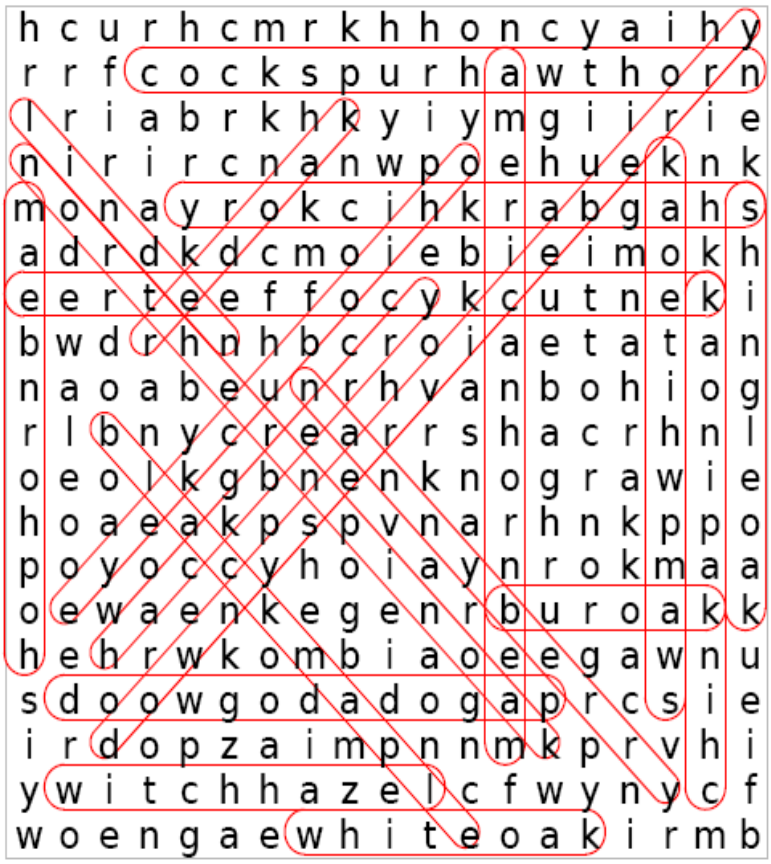
ANSWERS

20 Native Trees of Iowa



American Hornbeam
Black Maple
Bur Oak
Chinkapin Oak
Cockspur Hawthorn
Downy Serviceberry
Hackberry
Hophornbeam
Kentucky Coffeetree
Linden
Nannyberry
Northern Pin Oak
Ohio Buckeye
Pagoda Dogwood
Red Oak
Shagbark Hickory
Shingle Oak
Swamp White Oak
White Oak
Witchhazel

ANSWERS Matching Wildlife Worksheet: Match the picture of the woodland animal to their description

Indiana Bat

Habitat: Oak Hickory Forests
Food: acorns, hickory nuts and walnuts
Nesting: In large mature trees
Young: 3 or 4 twice a year
Size: 2 inches tall and ¼ an ounce
Fun Fact: they steer with their tails as they fly

Pileated Woodpecker

Habitat: Large trees with loose bark, slow moving rivers, and caves
Food: night flying insects
Nesting: loose bark of trees, caves in winter
Young: 1
Size: 10 inches long and 3 ounces
Fun Fact: 30,000 insects eaten per feeding

Iowa Pleistocene Snail

Habitat: Cold air slopes with leaf litter and rocks
Food: fallen leaves of birch, maple and dogwood
Nesting: fallen leaves
Young: 2 to 6
Size: ¼ of an inch
Fun Fact: Known from fossil records to have existed 400,000 years ago. Once thought to be extinct but was discovered again in 1955.

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Habitat: At least 250 acres of medium to mature even aged forests dominated by maple and cottonwood trees
Food: Small mammals, birds, reptiles, amphibians, and crayfish
Nesting: large mature trees
Young: 2 to 5
Size: 17 inches tall and 1 ½ pounds
Fun Fact: Nests in the same spot year after year

Red Shouldered Hawk

Habitat: Mature Forests
Food: Insects, primarily carpenter ants and wood-boring beetle larvae, fruits, and nuts
Nesting: in tree unlined except for wood chips
Young: 1 to 6
Size: 17 inches tall and 10 ounces
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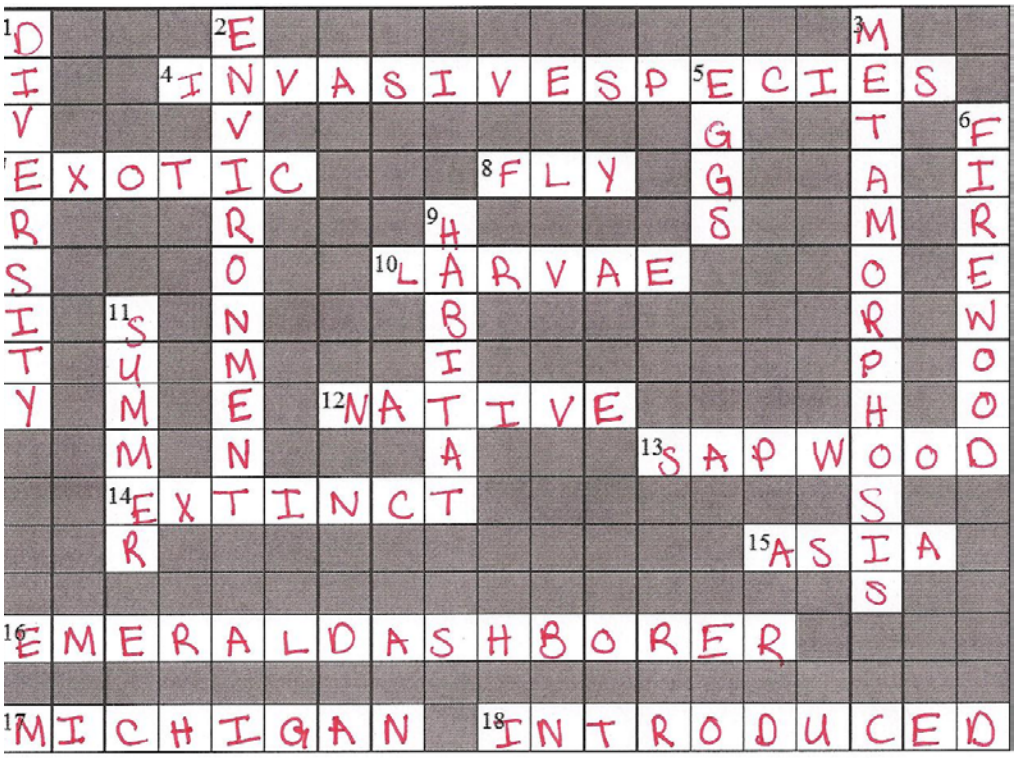
Extra Activity: Emerald Ash Borer Crossword Puzzle ANSWERS



ACROSS

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8. how EAB travels short distances
10. young that look different for adults prior to metamorphosis
12. occurs naturally in an area
13. the part of a tree where water and nutrients move up and down
14. a species no longer found on earth
15. EAB's native habitat
16. an exotic beetle that feeds on the inner bark of ash trees
17. Where EAB was shipped to from Asia
18. another name for exotic species

DOWN

1. a combination of different species that make up a healthy environment
2. all the living and nonliving things that surround and affect a living thing
3. A change in the form of an animal during normal development
5. EAB can lay almost 80 of these in that bark of a tree
6. how EAB travels long distances
9. a place that provides food, water, shelter and other needs for an organism
11. when EAB lays its eggs

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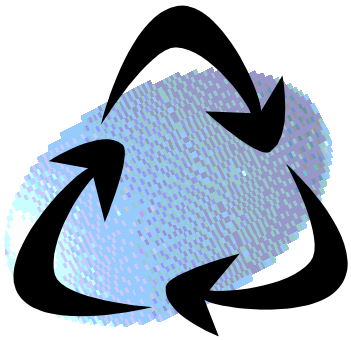
Trees for Kids

Ecological Diversity

2009-2010 School Year

Please contact the Trees for Kids / Teens Coordinator at 515 / 281-6749 if you would like a printed copy of these materials or go to the Trees For Kids webpage at:
www.iowadnr.gov/forestry/treesforkids



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